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Date 10-18/2001

Serial Number of Application 091686,197

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Building (circle one) CP2 CPK1 Floor 5 Room # D24

Number of Results returned (Minimum 50/ Maximum 300) 100

Keywords to emphasize


ASSISTANT-EXAMINER: Bartz; C. T.

ATTY-AGENT-FIRM: McCarthy; Jack N.

ABSTRACT:

An oscillatable nozzle sprinkler with operationally changeable nozzles from the top. One configuration consists of a multiple nozzle cylindrical sleeve which allows a desired nozzle for flow rate and trajectory to be rotationally selected while the sprinkler is operating. Another configuration allows individual nozzles to be inserted into the top of the sprinkler housing while the sprinkler is operating.

19 Claims, 6 Drawing figures  
Exemplary Claim Number: 1  
Number of Drawing Sheets: 3

BRIEF SUMMARY:

DESCRIPTION

1. Technical Field

This invention relates to oscillatable sprinklers with multiple nozzles of different flow rates and discharge trajectories that can be selectably changed when the sprinkler is installed and operating.

2. Background Art

In U.S. Pat. No. 5,098,021 an integrated system is set forth for varying the flow rate of a single nozzle to meet precipitation rate requirements for varying arcs of oscillating coverage. No provision is provided to correct the flow rate of the nozzle for varying ranges when using a nozzle stream break-up screw to limit the nozzle range.

U.S. Pat. No. 5,104,045 relates to sprinkler nozzles having flow passages for obtaining desired precipitation coverage. This patent shows how nozzles are typically installed and retained in oscillating sprinkler nozzle housings.

U.S. Pat. No. 4,867,378 shows a sprinkler device for directing a flow of water therefrom having a single nozzle in a nozzle housing assembly, said sprinkler having an output drive shaft.

Other sprinklers in the market place have separate nozzles of different flow rates or trajectories but can only be installed into the sprinkler nozzle housing when the sprinkler is not operating. In order to change to a new desired nozzle the undesired nozzle which was installed in the sprinkler's nozzle housing must also be removed before the new desired replacement nozzle can be installed.

DISCLOSURE OF INVENTION

It is an object of this invention to make it possible to select a nozzle for the desired range and flow rate to provide the desired precipitation rate while the sprinkler is operating. This is accomplished by molding or inserting various nozzles around the circumference of a cylinder which is rotationally mounted on the nozzle housing. The desired nozzle can be rotated into the flow path while the sprinkler is operating if it is desired to change the range and/or flow rate of the sprinkler. After installation if it is found that a local area of the yard needs more or less water from that of the other sprinklers running in that irrigation zone it is only necessary to rotate the multiple nozzle selection sleeve, or cylinder, to a different flow rate or trajectory nozzle as indicated around the top circumference of the nozzle selection sleeve to provide an increased or decreased precipitation for this area of the yard.

Also, the sprinkler may be shut off at the sprinkler by turning the nozzle selection cylinder to a blank rotational location indicated as off.

An alternate configuration is also shown which also allows the nozzle to be changed during operation from the top and behind the stream, but has the disadvantage that the other nozzles must be carried separately and are not present on the sprinkler at all times and immediately available after installation.

This concept makes it simple to locally increase or decrease the sprinklers flow rate to better match the precipitation to varying soil or sun light conditions after the installation has been completed and the landscaping has stabilized.

Optimum water usage can thus be more easily achieved. The easy removal of the nozzle selection sleeve also makes cleaning of dirt or debris from the nozzle easy compared to other sprinklers now on the market and can be done without having to shut the system off and then turned back on after the nozzle has been cleaned.

#### DRAWING DESCRIPTION:

##### BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a fragmentary sectional side view of a rotatable sprinkler nozzle housing assembly being driven by an output shaft and showing the rotationally mounted multiple nozzle selection sleeve.

FIG. 2 is a top view of the nozzle housing assembly showing the nozzle identification around the top circumference of the nozzle selection sleeve. Also the removal slot and retention lug can be seen for retaining or allowing removal of the nozzle selection sleeve from the nozzle housing assembly.

FIG. 3 is a fragmentary sectional side view of a rotatable sprinkler nozzle housing assembly showing a nozzle insert plate removable and insertable from the top.

FIG. 4 is a top view with a cut away of the nozzle housing assembly showing the removable nozzle insert plate in position.

FIG. 5 shows the multiple nozzle selection sleeve removed from the nozzle housing.

FIG. 6 shows a nozzle insert plate.

#### DETAILED DESCRIPTION:

##### BEST MODE FOR CARRYING OUT INVENTION

Referring to FIG. 1 and FIG. 2 of the drawings, a rotatable nozzle sprinkler is shown having a cylindrical nozzle housing assembly 1 mounted for rotation about axis x-x on the top of a riser assembly 2. The riser assembly has a center shaft opening at its upper end for the nozzle housing assembly drive shaft 5 to exit the riser assembly 2 and be connected to the nozzle housing assembly 1.

The nozzle drive shaft 5 is hollow and water is supplied to the nozzle housing 16 through the hollow center passage of the nozzle drive shaft 5 into a flow passage 15 in the nozzle housing 16. Water enters the riser assembly 2 at its lower end and is used to power a rotary drive mechanism for turning the nozzle drive shaft 5 before exiting the riser assembly through the hollow center passage of the nozzle drive shaft 5.

The nozzle housing 16 flow passage 15 extends through the nozzle housing 16 to the outside of the nozzle housing at an upward angle. The constructions of a nozzle housing with a flow passage is shown in U.S. Pat. No. 5,098,021 and U.S. Pat. No. 5,104,045.

The flow passage 15 in the nozzle housing does not determine the sprinkler's stream trajectory for this design. A separate nozzle selection cylindrical sleeve 40 which is rotationally mounted on the nozzle housing 16 has multiple individual nozzles 42 molded into the sleeve wall 44. Each nozzle can be separately configured to give a desired trajectory angle and sized to provide a desired flow

LITIGATION SEARCH US 5,826,797 (09/686,197)

QUESTEL-ORBIT:

Databases : LGST, CRXX, PAST, LITA

Term not in index/PN-LITA : US5826797

LGST	1
CRXX	1
PAST	4
LITA	0

1/6 LGST (1/1) - (C) LEGSTAT  
PN - US 5826797 [US5826797]  
AP - US 405033/95 19950316 [1995US-0405033]  
DT - US-P  
ACT - 19950316 US/AE-A  
APPLICATION DATA (PATENT)  
{US 405033/95 19950316 [1995US-0405033]}  
- 19981027 US/A  
PATENT  
- 19991228 US/RR [+]  
REQUEST FOR REEXAMINATION FILED  
19991004  
- 20001219 US/RF  
REISSUE APPLICATION FILED  
20001010  
- 20010403 US/B1 [+]  
REEXAMINATION CERTIFICATE FIRST REEXAMINATION  
The patentability of claims 12-15 is confirmed. Claim 3 is cancelled.  
Claims 1, 4-11, 16 and 18 are determined to be patentable as amended.  
Claims 2, 17 and 19, dependent on an amended claims are determined to  
be patentable. New claims 20 and 21 are added and determined to be  
patentable.  
- 20010403 US/C1  
REEXAMINATION CERTIFICATE (1ST LEVEL)  
- 20010814 US/RF  
REISSUE APPLICATION FILED  
20001010  
- 20010918 US/RF  
REISSUE APPLICATION FILED  
20001010  
UP - 2001-40

2/6 CRXX (1/1) - (C) CLAIMS/RRX  
AN - 3060784  
PN - 5,826,797 A 19981027 [US5826797]  
PA - Kah, Carl L C III  
PT - M (Mechanical)  
ACT - 19991004 REEXAMINATION REQUESTED  
ISSUE DATE OF O.G.: 19991228  
REEXAMINATION REQUEST NUMBER: 90/005526  
Michael H. Jester, San Diego, CA  
- 20001010 REISSUE REQUESTED  
ISSUE DATE OF O.G.: 20001219  
REISSUE REQUEST NUMBER: 09/686197  
EXAMINATION GROUP RESPONSIBLE FOR REISSUEPROCESS: 3613

Reissue Patent Number:  
- 20001010 REISSUE REQUESTED  
ISSUE DATE OF O.G.: 20010814  
REISSUE REQUEST NUMBER: 09/686197  
EXAMINATION GROUP RESPONSIBLE FOR REISSUEPROCESS: 3752  
Reissue Patent Number:  
- 20001010 REISSUE REQUESTED  
ISSUE DATE OF O.G.: 20010918  
REISSUE REQUEST NUMBER: 09/686197  
EXAMINATION GROUP RESPONSIBLE FOR REISSUEPROCESS: 3613  
Reissue Patent Number:  
- 20010403 REEXAMINED CERTIFICATE C15826797, SEQUENCE 4305th  
REQUEST - 90/005526, Michael H. Jester, San Diego, CA, US (999104 )  
CLAIM - AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT: The  
patentability of claims 12-15 is confirmed. Claim 3 is cancelled.  
Claims 1, 4-11, 16 and 18 are to be patentable as amended. Claims 2,  
17 and 19, dependent on an amended claims are determined to be  
patentable. New claims 20 and 21 are added and determined to be  
patentable. 1. A aprinkler (having) comprising: a rotatable nozzle  
housing having a water passage formed therein; an output shaft  
mechanically connected to said rotatable nozzle housing for rotating  
said nozzle housing(,); a manually adjustable rotatable sleeve having  
an inner surface and a plurality of circumferentially spaced  
(orifices;) nozzles, each of said nozzles having mutually different  
configurations from each other, said rotatable sleeve (is) being  
slidably installed around the nozzle housing and being in rotational  
relationship therewith and thereto so that said rotatable sleeve can  
be selectively positioned to align one of said plurality of nozzles  
with the discharge end of the water passage for distributing water  
outwardly from said sprinkler; sealing means surrounding the discharge  
end of (a) the water passage formed in said nozzle housing (;), said  
sealing means including a seal member surrounding the discharge end of  
the water passage and dimensioned to continuously bear against said  
inner surface of said rotatable sleeve to provide a sealed connection  
to the pressurized water passage of the nozzle housing (, wherein said  
rotatable sleeve is selectively positioned to align one of said  
plurality of orifices with said discharge end of the water passage for  
distributing water outwardly from said sprinkler,); and means for  
retaining said (nozzle selection) rotatable sleeve in place.

UP - 1999-51

UACT- 2001-09-18 .

3/6 PAST (1/4) - (C) PAST

AN - 200138-001453

PN - 5826797 A [US5826797]

DT - A (UTILITY)

OG - 2001-09-18

CO - REA

ACT - REISSUE APPLICATION FILED

SH - REISSUE APPLICATION FILED

4/6 PAST (2/4) - (C) PAST

AN - 200133-001700

PN - 5826797 A [US5826797]

DT - A (UTILITY)

OG - 2001-08-14

CO - REA

ACT - REISSUE APPLICATION FILED  
SH - REISSUE APPLICATION FILED

5/6 PAST (3/4) - (C) PAST  
AN - 200114-001969  
PN - 5826797 A [US5826797]  
DT - A (UTILITY)  
OG - 2001-04-03  
CO - RXC  
ACT - REEXAMINATION CERTIFICATE  
SH - REEXAMINATION CERTIFICATE

6/6 PAST (4/4) - (C) PAST  
AN - 200051-001109  
PN - 5826797 A [US5826797]  
DT - A (UTILITY)  
OG - 2000-12-19  
CO - REA  
ACT - REISSUE APPLICATION FILED  
SH - REISSUE APPLICATION FILED

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LEXIS AND NEXIS:  
ALL PATENT FILES

PATNO IS 5826797

Your search request has found 2 PATENTS through Level 1.

LEVEL 1 - 1 OF 2 PATENTS

<5,826,797>

REEXAMINATION CERTIFICATE C1 (4305th)

Apr. 3, 2001

Operationally Changeable Multiple Nozzles Sprinkler

DISCLAIMER: This patent is subject to a terminal disclaimer.

CORE TERMS: nozzle, housing, rotatable, sleeve, sprinkler, cylindrical, exit,  
orifice, sealing, riser...

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LEVEL 1 - 2 OF 2 PATENTS

<5,826,797>

Oct. 27, 1998

Operationally changeable multiple nozzles sprinkler

LIT-REEX: Reexamination requested Oct. 4, 1999 by Michael H. Jester,  
Reexamination no. 90/005,526 (O.G. Dec. 28, 1999) Ex. Gp.: 3752

REISSUE: Reissue Application filed Oct. 10, 2000 (O.G. Sep. 18, 2001) Ex. Gp.: 3613; Re. S.N. 09/686,197

Reissue Application filed Oct. 10, 2000 (O.G. Aug. 14, 2001) Ex. Gp.: 3752; Re. S.N. 09/686,197

Reissue Application filed Oct. 10, 2000 (O.G. Dec. 19, 2000) Ex. Gp.: 3613; Re. S.N. 09/686,197

CORE TERMS: nozzle, housing, sprinkler, sleeve, rotatable, riser, ring, cylindrical, orifice, drive shaft...

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CASES:

Your search request has found no CASES.

JOURNALS:

Your search request has found no ITEMS.

NEWS STORIES:

Your search request has found no STORIES.

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#### DIALOG INFORMATION SERVICES

File 345:Inpadoc/Fam.& Legal Stat 1968-2001/UD=200140  
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S1 1 PN="US 5826797"

1/39/1  
DIALOG(R) File 345:Inpadoc/Fam.& Legal Stat  
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13073694

Basic Patent (No,Kind,Date): IL 116462 A0 19960331 <No. of Patents: 006>

Patent Family:

Patent No	Kind	Date	Applic No	Kind	Date	
AU 9540669	A1	19960926	AU 9540669	A	19951222	
EP 732149	A2	19960918	EP 95630117	A	19951113	
EP 732149	A3	19961211	EP 95630117	A	19951113	
IL 116462	A0	19960331	IL 116462	A	19951219	(BASIC)
US 5826797	A	19981027	US 405033	A	19950316	
US 5826797	C1	20010403	US 405033	A	19950316	

Priority Data (No,Kind,Date):

US 405033 A 19950316

PATENT FAMILY:

AUSTRALIA (AU)

Patent (No,Kind,Date): AU 9540669 A1 19960926  
OPERATIONALLY CHANGEABLE MULTIPLE NOZZLES SPRINKLER (English)  
Patent Assignee: CARL L C KAH III  
Author (Inventor): KAH CARL L C III  
Priority (No,Kind,Date): US 405033 A 19950316  
Applic (No,Kind,Date): AU 9540669 A 19951222

IPC: \* B05B-001/16  
Language of Document: English

EUROPEAN PATENT OFFICE (EP)

Patent (No,Kind,Date): EP 732149 A2 19960918  
OPERATIONALLY CHANGEABLE MULTIPLE NOZZLES SPRINKLER (English; French;  
German)

Patent Assignee: KAH III CARL L C (US)  
Author (Inventor): KAH III CARL L C (US)  
Priority (No,Kind,Date): US 405033 A 19950316  
Applic (No,Kind,Date): EP 95630117 A 19951113  
Designated States: (National) DE; ES; FR; GB; IT  
IPC: \* B05B-003/04; B05B-001/16  
Derwent WPI Acc No: \* G 96-414279; G 96-414279  
Language of Document: English

Patent (No,Kind,Date): EP 732149 A3 19961211  
OPERATIONALLY CHANGEABLE MULTIPLE NOZZLES SPRINKLER (English; French;  
German)

Patent Assignee: KAH III CARL L C (US)  
Author (Inventor): KAH III CARL L C (US)  
Priority (No,Kind,Date): US 405033 A 19950316  
Applic (No,Kind,Date): EP 95630117 A 19951113  
Designated States: (National) DE; ES; FR; GB; IT  
IPC: \* B05B-003/04; B05B-001/16  
Derwent WPI Acc No: \* G 96-414279  
Language of Document: English

EUROPEAN PATENT OFFICE (EP)

Legal Status (No,Type,Date,Code,Text):

EP 732149 P 19950316 EP AA PRIORITY (PATENT  
APPLICATION) (PRIORITAET (PATENTANMELDUNG))

EP 732149 P 19951113 EP AE US 405033 A 19950316  
EP-APPLICATION  
(EUROPAEISCHE ANMELDUNG)

EP 732149 P 19960918 EP AK EP 95630117 A 19951113  
DESIGNATED CONTRACTING  
STATES IN AN APPLICATION WITHOUT SEARCH  
REPORT: (IN EINER ANMELDUNG OHNE  
RECHERCHENBERICHT BENANNTE VERTRAGSSTAATEN)

EP 732149 P 19960918 EP A2 DE ES FR GB IT  
PUBLICATION OF APPLICATION  
WITHOUT SEARCH REPORT (VEROEFFENTLICHUNG DER  
ANMELDUNG OHNE RECHERCHENBERICHT)

EP 732149 P 19961211 EP AK DESIGNATED CONTRACTING  
STATES IN A SEARCH REPORT: (IN EINEM  
RECHERCHENBERICHT BENANNTE VERTRAGSSTAATEN)

EP 732149 P 19961211 EP A3 DE ES FR GB IT  
SEPARATE PUBLICATION OF THE  
SEARCH REPORT (ART. 93) (GESONDERTE  
VEROEFFENTLICHUNG DES RECHERCHENBERICHTS  
(ART. 93))

EP 732149 P 19970730 EP 17P REQUEST FOR EXAMINATION  
FILED (PRUEFUNGSANTRAG GESTELLT)  
970531



EP 732149

P 19980708 EP 18W

WITHDRAWN (ZURUECKGENOMMEN)

980508

ISRAEL (IL)

Patent (No,Kind,Date): IL 116462 A0 19960331  
OPERATIONALLY CHANGEABLE MULTIPLE NOZZLE SPRINKLER (English)  
Patent Assignee: KAH CARL L C III  
Priority (No,Kind,Date): US 405033 A 19950316  
Applic (No,Kind,Date): IL 116462 A 19951219  
IPC: \* B05B  
Language of Document: English

UNITED STATES OF AMERICA (US)

Patent (No,Kind,Date): US 5826797 A 19981027  
OPERATIONALLY CHANGEABLE MULTIPLE NOZZLES SPRINKLER (English)  
Patent Assignee: KAH III CARL L C (US)  
Author (Inventor): KAH III CARL L C (US)  
Priority (No,Kind,Date): US 405033 A 19950316  
Applic (No,Kind,Date): US 405033 A 19950316  
National Class: \* 239394000; 239391000  
IPC: \* A61C-031/02  
Derwent WPI Acc No: \* G 96-414279  
Language of Document: English

Patent (No,Kind,Date): US 5826797 C1 20010403  
OPERATIONALLY CHANGEABLE MULTIPLE NOZZLES SPRINKLER (English)  
Patent Assignee: KAH CARL L C III (US)  
Author (Inventor): KAH CARL L C III (US)  
Priority (No,Kind,Date): US 405033 A 19950316  
Applic (No,Kind,Date): US 405033 A 19950316  
National Class: \* 023939400  
IPC: \* B05B-001/16  
Derwent WPI Acc No: \* G 96-414279  
Language of Document: English

UNITED STATES OF AMERICA (US)

Legal Status (No,Type,Date,Code,Text):  
US 5826797 P 19950316 US AE APPLICATION DATA (PATENT)  
(APPL. DATA (PATENT))  
US 405033 A 19950316  
US 5826797 P 19981027 US A PATENT  
US 5826797 P 19991228 US RR REQUEST FOR REEXAMINATION  
FILED  
19991004  
US 5826797 P 20001219 US RF REISSUE APPLICATION FILED  
(REISSUE APPL. FILED)  
20001010  
US 5826797 P 20010403 US B1 REEXAMINATION CERTIFICATE  
FIRST REEXAMINATION  
The patentability of claims 12-15 is  
confirmed. Claim 3 is cancelled. Claims 1,  
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added and determined to be patentable.  
US 5826797 P 20010403 US C1 REEXAMINATION CERTIFICATE

(1ST LEVEL)  
US 5826797 P 20010814 US RF REISSUE APPLICATION FILED  
(REISSUE APPL. FILED)  
20001010  
US 5826797 P 20010918 US RF REISSUE APPLICATION FILED  
(REISSUE APPL. FILED)  
20001010

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